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Art Unit: 2611
Confirmation No.: 8782
Examiner: Khanh Tran

IN THE CLAIMS

CLAIMS

We claim:

1. (Currently amended) In a method for equalizing a multi-channel electronic communication system by employing any initial reference channel of the type wherein the input signals and an independently generated noise are received [,] and are converted from analog to digital [, channel matched, equalized using tap weight vectors] and the channels are adaptively equalized, and then [employed] employing an initial set of equalized data for adaptive beam forming, the improvement comprising the following steps:

[a step for intelligently selecting from the available operating channels of the system, a reference channel which produces improved equalization.]

(a) selecting from the initial set of equalized data a systemically significant number of channels having the largest cancellation ratio;

(b) utilizing the selected number of channels as an updated input for a second equalization process applied to the then operating channels of the system resulting in a second set of equalized data;

(c) employing the second set of equalized data to determine an updated reference channel for input to the equalization process; and

(d) repeating the steps (a) through (c) substituting the most recently updated reference channel for the initial reference channel.

2. (Currently amended) The method of claim 1, wherein the [step for performing intelligent selection is accomplished by calculating which potential reference channel has the best cancellation ratio] initially selected reference channel is that channel having the greatest mean calibration signal.

3. (Canceled) [The method of claim 2, further comprising the step of updating the selected reference channel during each calibration cycle.]

4. (Currently amended) The method of claim [3]1, wherein the [step for performing the updating] number of channels to be selected is [accomplished] maximized by sampling as many of the available channels as is practical given the limitations of the system. [and the time between cycles.]

5. (Currently amended) The method of claim 1, wherein the step (d) (repeating of the steps (a) through (c)) occurs during each operation cycle. [In a method for equalizing a multi-channel electronic communication system by employing a reference channel of the type wherein the input signals and a generated noise are received, converted from analog to digital, channel

matched, equalized using tap weight vectors, and then employed for adaptive beam forming, the improvement comprising:

the step of updating the selected reference channel during each calibration cycle.]

6. (Canceled) [The method of claim 5, wherein the step for performing the updating is accomplished by sampling as many of the available channels as is practical given the limitations of the system and the time between cycles.]

7. (Canceled) [The method of claim 6, further comprising the step of performing intelligent selection from the available operating channels of the system, a reference channel which produces improved equalization.]

8. (Canceled) [The method of claim 6, further comprising the step of performing intelligent selection from the available operating channels of the system a reference channel, which produces improved equalization, by calculating which potential reference channel has the best cancellation ratio.]

9. (Currently amended) In an apparatus for equalizing a multi-channel electronic communication system by employing an initial reference channel of the type wherein the input signals and a separately generated noise are received by a means for receiving [component] in analog form, transmitted to a means for converting component which provides a digital output to [separately to an adaptive equalization component and to an equalization filter component, the channel matching component determines and sends tap weight vectors to the equalization filter component, and the equalization filter

component combines the digital output from the converter component and the tap weight vectors to generate] a means for adaptively equalizing the digital output, and providing a first set of equalized data which first set of equalized data is transmitted as an input to the adaptive beam forming component, where the transmission, generation, sending and providing of such signals in the existing and improved apparatus are by appropriate means for such functions, the improvement comprising:

[A means for intelligently selecting from the available operating channels of the system, a reference channel which improved equalization, the selecting means being integrated with the system such that it receives inputs from the converting and equalization filter components and provides an output to the adaptive equalization processor.]

a means for a primary calculation of a cancellation ratio of each channel, said primary calculating means being connected to receive from the existing equalization apparatus a transmission of the first set of equalized data and then to provide an output of the calculated primary cancellation ratios;

a means for selecting a systemically significant number of channels having the largest cancellation ratio, said selecting means being connected to receive an input from the primary cancellation ratio calculator and to provide as an output the systemically significant number of selected channels;

a means for adaptively equalizing each channel by utilizing the analog-to-digital (A/D) converted data from the existing equalization apparatus and the output of the means for channel selection, said equalizing means being connected to receive transmissions of the A/D data and the channels selected as inputs and to provide a second set of equalizcd data as an output;

a means for a secondary calculation of a secondary cancellation ratio of each channel, said means being connected to receive as input the second set of equalized data and then to provide an output of the calculated secondary cancellation ratios;

a means for averaging the secondary calculated cancellation ratios for each channel, said averaging means being connected to receive as input the secondary cancellation ratios and to transmit as output the averaged cancellation ratios; and

a means for comparing the average cancellation ratios for each channel to identify a channel with the largest average cancellation ratio, said comparing means being connected to rcceive as input the average cancellation ratios and to transmit as output the identified largest cancellation ratio channel; and

a means for repeatedly substituting the most recently identified largest cancellation ratio channel for the previously employed reference channel.

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10. (Currently amended) The apparatus of claim 9, wherein the channel selecting means [for selecting the reference channel is a component which determines and selects the available channel with the largest cancellation ratio] maximizes the number of channels selected by sampling as many of the available channels as is practical given the limitations of the system.

11. (Currently amended) The apparatus of claim 9, wherein the substituting means works in combination with all other means and components to substitute the most recently identified largest average cancellation ratio channel for the previously employed reference channel during each operation cycle. [apparatus of claim 10, further comprising an updating means for performing the reference channel selection during each cycle, such updating means being structurally integrated into the selecting means component.]

12. (Canceled) [The apparatus of claim 11, wherein the updating means samples as large a number of available channels as is practical given the limitations of the system and the time between cycles.]

13. (Canceled) [In an apparatus for equalizing a multi-channel electronic communication system by employing a reference channel of the type wherein the input signals and a generated noise are received by a receiving component in analog form, transmitted to a converting component which provides a digital output separately to a channel matching/adaptive equalization component and to an equalization filter component, the channel matching component determines and sends tap weight vectors to the equalization filter component, and the equalization filter component combines the digital output from the converter component and the tap weight

vectors to generate input to the adaptive beam forming component, where the transmission, generation, sending and providing of such signals are by appropriate means for such functions, the improvement comprising:

an updating means for performing the reference channel selection during each cycle, such updating means being structurally integrated into the channel matching component.]

14. (Canceled) [The apparatus of claim 13, wherein the updating means samples as large a number of available channels as is practical given the limitations of the system and the time between cycles.]

15. (Canceled) [The apparatus of claim 14, further comprising a means for intelligently electing from the available operating channels of the system, a reference channel which produces improved equalization, the electing means being structurally integrated with the system such that it receives inputs from the converting and equalization filter components and provides an output to the adaptive equalization processor.]

16. (Canceled) [The apparatus of claim 14, wherein the means for intelligently electing the reference channel is a component which determines and selects the available channel with the largest cancellation ratio.]

17. (Canceled) [The apparatus of claim 13, wherein the means for selecting the reference channel is a component which determines and selects the available channel with the largest cancellation ratio.]